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## **Looking on the bright side of life: Gratitude and experiences of interpersonal transgressions in adulthood and daily life**

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**Abstract:** **OBJECTIVE:** Gratitude plays an important role in individual and social well-being. However, less is known about the link between gratitude and experiences of interpersonal stressors. The current research examined the associations between gratitude and interpersonal transgressions. **METHOD:** One cross-sectional study with a broad age range and two daily diary studies (total N = 2,348; total age range: 18-91) were used to test the associations on the between- and within-person level. **RESULTS:** A consistent result across all studies was that dispositionally grateful individuals tended to report fewer interpersonal transgressions than less grateful people. In turn, people who generally reported more interpersonal transgressions were less grateful in daily life. Moreover, higher gratitude on one specific day was associated with fewer reported transgressions on the same day. However, the results from the daily diary studies indicated differences between the samples. Whereas gratitude was consistently associated with interpersonal transgressions in one daily diary sample, the findings in the second daily diary sample were less consistent. **CONCLUSION:** The present findings suggest that grateful people tend to perceive their social exchanges differently and/or actually experience fewer interpersonal transgressions. Future work is needed to test the underlying mechanisms of this negative association.

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Looking on the Bright Side of Life: Gratitude and Experiences of Interpersonal  
Transgressions in Adulthood and Daily Life

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### **Abstract**

**Objective:** Gratitude plays an important role for individual and social well-being. However, less is known about the link between gratitude and experiences of interpersonal stressors. The current research examined the associations between gratitude and interpersonal transgressions.

**Method:** One cross-sectional study with a broad age range and two daily diary studies (total  $N = 2,348$ ; total age range: 18-91) were used to test the associations on the between- and within-person level.

**Results:** A consistent result across all studies was that dispositionally grateful individuals tended to report fewer interpersonal transgressions than less grateful people. In turn, people who generally reported more interpersonal transgressions were less grateful in daily life.

Moreover, higher gratitude on one specific day was associated with fewer reported transgressions on the same day. However, the results from the daily diary studies indicated differences between the samples. Whereas gratitude was consistently associated with interpersonal transgressions in one daily diary sample, the findings in the second daily diary sample were less consistent.

**Conclusion:** The present findings suggest that grateful people tend to perceive their social exchanges differently and/or actually experience fewer interpersonal transgressions. Future work is needed to test the underlying mechanisms of this negative association.

*Keywords:* gratitude; interpersonal transgressions; daily diary; adulthood

## **Looking on the Bright Side of Life: Gratitude and Experiences of Interpersonal Transgressions in Adulthood and Daily Life**

People differ in their tendency to be grateful and these individual differences are related to numerous individual and social benefits. For instance, research has shown that being more grateful is related to higher subjective well-being (Emmons & McCullough, 2003; Nezlek, Newman, & Thrash, 2017; Wood, Froh, & Geraghty, 2010), better physical health (Hill, Allemand, & Roberts, 2013; O'Connell & Killeen-Byrt, 2018), and better interpersonal relationships (Algoe, Fredrickson, & Gable, 2013; Algoe, Haidt, & Gable, 2008). Moreover, grateful individuals tend to build and maintain close and strong social relationships (Gordon, Impett, Kogan, Oveis, & Keltner, 2012; Lambert & Fincham, 2011; Williams & Bartlett, 2014). In addition, gratitude is related to lower levels of stress in general (Wood, Maltby, Gillett, Linley, & Joseph, 2008), and it may buffer against adverse outcomes (e.g., Kleiman, Adams, Kashdan, & Riskind, 2013). Despite the fact that gratitude plays an important role for individual (e.g., Chopik, Newton, Ryan, Kashdan, & Jarden, 2017) and social well-being (e.g., Algoe, Kurtz, & Hilaire, 2016), additional research is needed to investigate the link between gratitude and experiences of interpersonal stressors.

Interpersonal transgressions are one domain of stressors that may be particularly relevant to the study of gratitude and that relate to emotional and social distress (Leary, Diebels, Jongman-Sereno, & Fernandez, 2015; Serido, Almeida, & Wethington, 2004). Across all social domains and relationships, people sometimes experience interpersonal problems and transgressions, which can range from simple divergence in preferences over the experience of injustice to deep hurts or severe transgressions (Almeida, Wethington, & Kessler, 2002; McCullough, Emmons, Kilpatrick, & Mooney, 2003; Steiner, Allemand, & McCullough, 2011). However, it remains an open question whether grateful people experience and report fewer interpersonal transgressions. The main purpose of the present work thus was to examine the association between gratitude and experiences of interpersonal

transgressions using two research approaches. First, cross-sectional data were used to explore the between-person associations between dispositional gratitude and various types of interpersonal transgressions in a large sample with a broad age range. Second, daily diary data were used to test whether dispositional gratitude predicts the experience of fewer interpersonal transgressions in daily life and whether general interpersonal transgressions predict less gratitude in daily life. Finally, daily diary data were used to test within-person associations between gratitude and experiences of interpersonal transgressions in daily life.

### **Linking Gratitude and Interpersonal Transgressions**

Dispositional gratitude has been defined as a “generalized tendency to recognize and respond with grateful emotion to the roles of other people’s benevolence in the positive experiences and outcomes that one obtains” (McCullough, Emmons, & Tsang, 2002, p. 112). It has been suggested that people high on this affective disposition typically experience gratitude more frequently and intensely, and that for these people gratitude may be elicited through a wide range of stimuli (McCullough et al., 2002). Another definition sees dispositional gratitude “as part of a wider life orientation toward noticing and appreciating the positive in the world” (Wood et al., 2010, p. 891). Consequently, do grateful people tend to perceive and experience fewer negative social interactions including interpersonal transgressions than less grateful people?

Although the association between dispositional gratitude and interpersonal transgressions has not yet been investigated empirically, multiple theoretical perspectives point to a likely association between the constructs. First, gratitude may influence how people perceive other people, life events, and interpersonal situations. For instance, gratitude may encourage positive perceptual and attentional biases since grateful people tend to focus on the positive in the world and less on the negative (Watkins, 2014; Wood et al., 2010). Gratitude may alter individuals’ perceptions in a positive way by leading them to actively seek for positive information, or to dwell on positive rather than on negative information (Wood et al.,

2008). Therefore, grateful people may be more likely to perceive events in their everyday life more positively rather than see social stressors as interpersonal transgressions.

Second, gratitude may influence how individuals remember other people, life events, and interpersonal situations. Previous research suggests that gratitude is related to a positive memory bias regarding negative memories (Lambert, Fincham, & Stillman, 2012; Watkins, Cruz, Holben, & Kolts, 2008), and that gratitude may buffer the effect of negative life events (Kashdan, Uswatte, & Julian, 2006; Ruini & Vescovelli, 2013). Indeed, this research has shown that grateful individuals not only tend to recall more positive memories, but they also tend to have more positive memories come to mind even when they are attempting to remember negative events. This positive memory bias indicates that an important component of gratitude may be an enhanced tendency to recall positive social interactions rather than negative events such as interpersonal transgressions.

Third, grateful people may evoke distinctive responses and reactions from others, since it is easier to interact with more grateful people as compared to less grateful ones. This view assumes that people tend to unconsciously evoke responses from others, which are consistent with their own characteristics (Buss, 1987; Roberts, Wood, & Caspi, 2008). For example, research from other areas finds that aggression typically evokes hostility from others (Dodge & Tomlin, 1987), or that dominant behavior often induces submissive responses (Thorne, 1987). Similarly, gratitude may evoke more positive responses such as prosocial behaviors rather than negative reactions from others such as transgressions. Indeed, one important function of gratitude is to reinforce and to motivate prosocial behavior by stimulating reciprocal moral and prosocial behavior in the future (McCullough, Kilpatrick, Emmons, & Larson, 2001). Research has shown that grateful people tend to experience prosocial behavior from others more often compared to people with lower levels in gratitude (McCullough et al., 2002). Furthermore, people who receive benefits from others are more likely to behave generously toward their partners (Tsang, 2006). Compelling evidence also

suggests that gratitude stimulates not only direct reciprocal altruism towards the benefactor, but also towards other people (Nowak & Roch, 2007).

Fourth, grateful people may be attracted to and select experiences and situations that are consistent with their own dispositions (Caspi & Roberts, 2001; Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014). For example, research has shown that friends tend to resemble each other in various characteristics (Bahns, Pickett, & Crandall, 2011; Dishion, Patterson, Stoolmiller, & Skinner, 1991) because they may selectively choose to affiliate with similar others (e.g., Ennett & Bauman, 1994). Research on dating and marriage similarly indicates that individuals tend to enter relationships with people who are similar to themselves in terms of personality characteristics (e.g., Humbad, Donnellan, Iacono, McGue, & Burt, 2010). Although overall similarity correlations on personality variables tend to be rather weak with a magnitude rarely above .30 (e.g., Botwin, Buss, & Shackelford, 1997; Luo, 2009), previous research indicates that partner similarity in personality related dimensions may be a function of selection rather than socialization processes (Luo & Klohnen, 2005; Watson et al., 2004). For example, newlyweds already showed similarity in various personality related dimensions. Thus, grateful people may choose to affiliate with social network partners who are also more grateful than others. Consequently, such a similar social network may promote prosocial interactions in daily life more often and, at the same time, may diminish stressful interactions such as interpersonal conflicts and transgressions. Based on these different views, one would expect a negative association between gratitude and interpersonal transgressions.

### **Distinguishing Between Within- and Between-Person Variations**

Based on this theoretical reasoning, one would assume that the associations between dispositional gratitude and experienced interpersonal transgressions are bidirectional. The link between gratitude and interpersonal transgressions can be examined using cross-sectional and micro-longitudinal designs, as well as dispositional and daily measures of gratitude, respectively. The use of the respective design and measurement form, respectively, may have

implications for the interpretation of the results. Dispositional gratitude has been typically assessed using single-occasion measurement approaches that focus on how people experience gratitude in general. As a consequence, the assessment of dispositional gratitude is less contextualized. In contrast, daily gratitude can be assessed using repeated assessments that provide more accurate descriptions of everyday experiences than those obtained from single-occasion measurements. The time frame of each assessment focuses on how people experience gratitude on that day. The assessment of daily gratitude is more contextualized insofar that it may index daily responses to events and experiences that occur to people each day. Similarly, to assess interpersonal transgressions, researchers have employed multiple methods. One way is to ask people to retrospectively report how frequently they have experienced several types of interpersonal transgressions “in general” or “in the last 12 months” using cross-sectional designs with large samples. Typically, checklists include a diverse set of transgressions (McCullough et al., 2003) and are conceptually similar to those used in the tradition of life events checklists (e.g., Weathers et al., 2013). Another way is to ask people on a daily basis about their negative *daily* experiences such as stressful events and interpersonal transgressions using diary methods (Nezlek, 2012). This latter method helps to better understand how interpersonal transgressions manifest and are experienced in daily life. Although checklists may be very similar to diary methods, both methods are connected to different underlying cognitive processes (Schwarz, 1999). Additionally, previous research revealed that retrospective reports of coping and daily coping reports obtained during stressful events show only a moderate degree of correspondence (DeLongis & Holtzman, 2005; Ptacek, Smith, Espe, & Raffety, 1994). To capture both underlying cognitive processes of single occasion retrospective assessments and daily diary assessments and to address the potential lack of correspondence of these two assessment methods, it is important to use both methods. Previous work has shown that dispositional and daily or momentary gratitude are positively but not perfectly related (McCullough et al., 2002; Wood, Maltby, Stewart, Linley,



& Joseph, 2008) because they differ in their time frames and levels of specificity. To the best of our knowledge, no previous studies thus far have linked the two measurement forms with respect to interpersonal transgressions.

Moreover, it is important to distinguish the levels of analysis because the tendency to be grateful as well as the amount of experienced transgressions may differ *between* and also fluctuate *within* individuals (Fleeson & Jayswickreme, 2015; Fleeson & Wilt, 2010).

Investigating associations at the *between-person level* over repeated assessments in daily life helps to better understand how often people are grateful and experience interpersonal transgressions in real life (cf. Allemand & Mehl, 2017; Wrzus & Mehl, 2015). However, determining a relationship at the between-person level does not necessarily translate to how these variables are related at the within-person level (e.g., Mroczek, Spiro, & Almeida, 2003; Nezlek, 2011). That is, analyses of between-person associations yield knowledge of important variables that distinguish individuals from one another, whereas analyses of within-person associations yield insights into the dynamic relations between variables and their dependence on situational circumstances (Bolger & Laurenceau, 2013; Bolger, Davis & Rafaeli, 2003). Investigating associations at the within-person level in daily life helps us to better understand how changes and variations in behaviors and experiences are manifested in real life within individuals. In particular, it determines whether the between-person associations are limited to a description of co-occurrences of differences between individuals or can be included in the characterization of the ongoing, internal psychological functioning of individuals. For instance, some individuals may show a greater tendency to be grateful and experience fewer transgressions in general compared to other individuals (between-person level), but their tendency to be grateful and to experience transgressions may also vary from day to day (within-person level).

### **Overview of the Current Research**

The overall goal of the current research was to investigate prospective and concurrent associations between gratitude and interpersonal transgressions in both directions. To do so, we used data from one cross-sectional study with a broad age range (Study 1) and two daily diary studies (Studies 2 and 3). Studies 1 and 2 were conducted in the US and Study 3 in Germany. We sampled from two different countries for Studies 2 and 3 as an effort to replicate the findings across two samples. In order to investigate the associations between gratitude and transgressions from different perspectives, we examined both constructs cross-sectionally (Studies 1, 2, and 3) and micro-longitudinally (Studies 2 and 3). In so doing, we assessed dispositional gratitude as a general tendency at the beginning of each study and we assessed daily gratitude by asking participants about their gratitude at the end of each day during ten days. Similarly, at the beginning of each study we assessed overall experienced transgressions retrospectively and daily experienced transgressions at the end of each day during ten days. The specific goals of the current research were threefold. First, we investigated the cross-sectional association between dispositional gratitude and interpersonal transgressions in Studies 1, 2, and 3. Second, we tested prospective effects of dispositional gratitude on daily transgressions and prospective effects of overall transgressions on daily gratitude in Studies 2 and 3. More specifically, we investigated whether dispositional gratitude predicts how people experience their social daily lives in terms of interpersonal transgressions and/or whether overall experienced transgressions predict peoples' levels of gratitude in their daily life. Third, we examined within-person associations between daily reported gratitude and daily experienced transgressions in Studies 2 and 3. Overall, we did not only expect a negative between-person association between gratitude and interpersonal transgressions, but also a negative association between the two constructs at the within-person level.

## STUDY 1

The goal of Study 1 was to explore how frequently people experience different types of interpersonal transgressions “in general” and whether these transgressions are associated with dispositional gratitude at the between-person level. Furthermore, we controlled for potential variations in interpersonal transgressions as a function of the demographic characteristics age and gender. In line with previous cross-sectional research (e.g., Birditt, Fingerman, & Almeida, 2005; Miller, Charles, & Fingerman, 2009; Steiner et al., 2011), we expected a negative association between age and interpersonal transgressions with older adults reporting fewer interpersonal transgressions than younger adults. Based on previous research (e.g., Matud, 2004), which suggested that women score higher in chronic stress and minor daily stressors compared to men, we expected that women would report more transgressions than men.

## **Methods**

### **Participants and Procedure**

The sample consisted of 1,552 US adults (69.7% female) ranging in age from 18 to 91 years ( $M = 48.35$ ,  $SD = 16.26$ ). Of participants, 30.8% were working full-time, 14.1% part-time, and 54.7% as were unemployed. Only 5.7% of participants were currently full-time in school and 4.4% were part-time in school. Participants described themselves predominantly as White (79.1%), with 8.8% African/African American, 5.7% Asian, 4.1% Hispanic/Latin American, 0.1% Middle Eastern, and 2.1% as being of other racial or ethnic backgrounds. Participants were recruited through the survey-based research platform Qualtrics Panels ([www.qualtrics.com](http://www.qualtrics.com)). Each participant received survey panel credits equivalent roughly to \$20 compensation for the survey completion. All participants gave their written informed consent prior to study participation. All methods and procedures were approved by the ethics committee for psychological research at Carleton University.

### **Measures**

**Dispositional gratitude.** Gratitude was measured with the Gratitude Questionnaire-6 (GQ-6; McCullough et al., 2002). Participants rated their level of agreement with six items using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items were “I have so much in life to be thankful for” or “I am grateful for a wide variety of people.” The alpha reliability for this measure was 0.82. Research has shown that the GQ-6 has good psychometric properties, including a robust one-factor structure and good internal consistency, especially in light of its brevity (McCullough et al., 2002).

**Interpersonal transgressions.** Interpersonal transgressions were measured with the Transgression Occurrences Measure<sup>1</sup> (TOM; McCullough et al., 2003). Participants were instructed to indicate how often they have experienced several transgressions “in general” on a 5-point Likert-type scale from 1 (*never*) to 5 (*very often*) (see Table 1 for all items). The TOM was developed in the tradition of life event checklists (Scully, Tosi, & Banning, 2000). It focuses on perceived experiences of transgressions in general at a broader level of analysis and does not provide details about each specific transgression and the type of relationship to the transgressor. The alpha reliability for the measure was 0.96. Different types of transgressions were intercorrelated with a mean of  $r = .55$  (range:  $r_s = .38 - .77$ ). Mean scores of all transgressions were calculated. High scores indicate a higher frequency of interpersonal transgressions.

## Results

Table 1 shows the descriptive statistics for different types of transgressions and the zero-order correlations with gratitude, age, and gender. Transgressions such as “lied to you,” “failed to appreciate you adequately,” and “took advantage of you” were experienced most frequently. Moreover, gratitude and age were significantly and negatively related to all different types of interpersonal transgressions with small effects (Cohen, 1988). Table 2 shows the descriptive statistics for the overall mean score of transgressions and the zero-order correlations with gratitude and the demographic variables. In general, participants reported

that interpersonal transgressions occurred occasionally (overall mean:  $M = 2.57$ ,  $SD = 0.89$ ). Gratitude and age again were negatively associated with experience of interpersonal transgressions, and men tended to report fewer overall transgressions as well (Table 2). A multiple linear regression model was used to examine the association between gratitude and interpersonal transgressions, controlling for age and gender. The two predictor variables gratitude and age were grand-mean centered. Gratitude, age, and gender were negatively related to interpersonal transgressions (Table 3).

In summary, the results from Study 1 provided first evidence for a negative association between gratitude and interpersonal transgressions. In line with our expectations, people with higher levels of gratitude reported fewer interpersonal transgressions retrospectively. Additionally, age and gender were negatively associated with interpersonal transgressions, indicating that older people and men reported fewer interpersonal transgressions than younger people and women when asked retrospectively.

## **STUDIES 2 & 3**

The goals of Studies 2 and 3 were to replicate the cross-sectional findings of Study 1 as well as to examine the prospective influence of dispositional gratitude on daily transgressions and the prospective influence of transgressions on daily gratitude. Moreover, the two daily diary studies were used to test within-person associations between daily reported gratitude and daily experienced transgressions. Again, we controlled for the demographic characteristics age and gender. Research has shown that better educated adults tended to report more daily transgressions compared to less educated adults (Grzywacz, Almeida, Neupert, & Ettner, 2004). Therefore, we controlled for potential variations as a function of education.<sup>2</sup>

## **Methods**

### **Participants**

**Study 2.** Data come from a daily diary study of US adults across two workweeks.<sup>3</sup>

The sample included all participants who attended with a friend or their intimate partner, completed the baseline assessment, and filled in at least one daily assessment. This resulted in a sample of 352 participants (48.3% female) ranging in age from 18 to 77 years ( $M = 45.57$ ,  $SD = 13.71$ ). With respect to the highest level of education, 0.6% had some high school (grade 9-12) or less, 27% were high school graduate, 18.8% were college or trade school graduate, 30.4% were University graduate (e.g., B. A. or B. S.), 6% had some postgraduate education, 14.5% had a Master's degree, and 2.8% a Ph.D. or similar graduate degree (Law degree, MD, etc.). Participants rated their income to the household on a scale ranging from 1 (*low income*) to 5 (*upper income*;  $M = 2.97$ ,  $SD = 0.86$ ).

**Study 3.** Data come from a daily diary study of German adults across two workweeks.<sup>4</sup> The sample included all participants who attended with a friend or their intimate partner, completed the baseline assessment, and filled in at least one daily assessment. This resulted in a sample of 444 adults (50% female) ranging in age from 20 to 75 years ( $M = 47.63$ ,  $SD = 10.17$ ). With respect to the highest level of education, 16.4% had a primary school leaving certificate, 37.4% had a secondary school-leaving certificate, 9.2% had a vocational diploma, 9% had a general qualification for university entrance, 10.8% had a polytechnic degree, and 17.1% were University graduate (e.g., B. A. or B. S.). Participants rated their income to the household on a scale ranging from 1 (*low income*) to 5 (*upper income*;  $M = 2.88$ ,  $SD = 0.80$ ).

## **Procedure**

The procedures of both daily diary studies were identical. Participants were recruited through the survey-based research platform Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)). All questionnaires were completed online on this research platform. Each participant received \$20 for the initial survey and \$75 for the completion of at least seven of the ten daily questionnaires. First, participants completed a pretest assessment with several questionnaires,

including demographics, dispositional gratitude, and interpersonal transgressions in general. At pretest, participants were also asked to share a web link including a questionnaire with their romantic partner or a close friend to receive an observer-report on the participant's gratitude. Second, participants completed daily questionnaires each day from Monday to Friday for two weeks. Each day in the late afternoon participants received a link to the survey (exact times differed by the four different time zones) and they were instructed to complete the survey the same night. The links of the daily survey were left open until early morning next day. Daily assessments included measures of daily transgressions and daily gratitude. In Study 2, there were 444 (12.61%) observations of daily transgressions out of 3,520 potential observations (352 participants  $\times$  10 assessments). There were 899 missing observations (participants did not respond whether they experienced any transgression or not). In Study 3, there were 538 (12.12%) observations of daily transgressions out of 4,440 potential observations (444 participants  $\times$  10 assessments), and there were 1,152 missing observations. That is, participants did not respond whether they experienced any transgression or not. All participants gave their written informed consent prior to study participation. All methods and procedures were approved by the ethics committee for psychological research at Carleton University.

## Measures

**Dispositional gratitude.** Gratitude was measured at the initial assessment per self-report and observer-report using the Gratitude Questionnaire-6 (GQ-6; McCullough et al., 2002). Both methods were used to have a more reliable assessment of individual differences in gratitude. The GQ-6 items were slightly modified for partner-reports (e.g., “Your partner has so much in life to be thankful for” or “Your partner is grateful for a wide variety of people”). The alpha reliability estimates in Study 2 were 0.83 (self-report) and 0.81 (observer-report). Self-reports and observer-reports of gratitude were strongly correlated ( $r = .62, p < .01$ ). In Study 3, the alpha reliability for self-reported gratitude (GQ-6) was .74 and for

observer-reported gratitude was .73. Self-reported and observer-reported gratitude were significantly correlated ( $r = .60, p < .01$ ). Therefore, we used the averaged score for our analyses in both studies.

**Daily gratitude.** At the end of each day during the daily assessments, in Study 2 participants were asked to indicate how much they experienced the feelings “appreciative”, “thankful”, and “grateful” over the past 24 hours on a 5-point Likert-type scale ranging from 1 (*very rarely or never*) to 5 (*very often*). The reliability of the within-person change for the 3-item measure is 0.76 (Bolger & Laurenceau, 2013). In Study 3 we only used “appreciative” and “grateful” because the German word for “grateful” and “thankful” is the same (i.e., “dankbar”). Moreover, we used a 6-point Likert-type scale ranging from 1 (*very rarely or never*) to 6 (*very often*). The reliability of the within-person change for the 2-item measure is 0.58 (Bolger & Laurenceau, 2013).

**Interpersonal transgressions.** Interpersonal transgressions were measured at the initial assessment with a subset of the Transgression Occurrences Measure (TOM; McCullough et al., 2003). Similar types of transgressions were combined to six items to shorten the questionnaire. The items are shown in Table 4. Participants indicated how frequently these events occurred to them “in general” on a 7-point Likert-type scale from 1 (*not at all*) to 7 (*constantly*). Again, this measure assessed perceived experiences of transgressions at a broader level of analysis without asking for details about each transgression and the type of relationship to the transgressor. The alpha reliability for the measure was 0.89 in both studies.

**Daily interpersonal transgressions.** The same six categories of transgressions from the initial survey were included in the daily assessment. At the end of each day, participants were asked to indicate whether the different types of interpersonal transgressions happened to them during the past 24 hours (*yes* = 1 or *no* = 0). Daily frequency of transgressions was summed up for each day and each individual ranging from 0, indicating that people did not



experience any transgression at this day, to 6, indicating that all six types of transgressions occurred on this day. This measure also assessed experiences of transgressions without detailed information about each transgression or relation to the transgressor.

### **Analytic Strategy**

First, we examined the between-person association between dispositional gratitude and interpersonal transgressions using cross-sectional data from the initial assessment and the same analytical approach from Study 1. Second, to examine the prospective association between dispositional gratitude and daily interpersonal transgressions as well as the prospective association between transgressions and daily gratitude, we performed multilevel models with measurement points nested in participants using the lme4 package (Bates & Sakar, 2006) in R (R Core Team, 2017). The lme4 package allows controlling for the variance associated with random factors without data aggregation (Baayen, Davidson, & Bates, 2008). The multilevel analyses were conducted using a stepwise approach. First, we examined the hierarchical structure of the data by computing intraclass correlation coefficients (ICC) and investigated the within-person variation of our daily outcome variable (i.e., daily transgressions). We started our analyses with a reduced model that only included the daily variables (i.e., daily transgressions or daily gratitude) and participants as random factors. For the main analyses, we estimated mixed models with random intercepts and a random time slopes with two levels. We added the time slope merely to control for changes over time (cf. Bolger & Laurenceau, 2013). The time variable was coded as 0-4, and 7-11, since there were only daily assessments on workdays (Monday to Friday) during two workweeks. We added our predictors and control variables (i.e., age, gender, relationship type, education, and time) to the models and analyzed the two-level models with our daily outcome variables. To handle missing data, we used a generic function of the lme4 package (Bates & Sakar, 2006), which does not use the missing values, but maintains their position for the residuals and fitted values. As indicators of goodness of fit, the Akaike Information Criterion (AIC) and the

Bayesian Information Criterion (BIC) are provided, evaluating the model with a lower fit as the better model. The between-person predictors gratitude, age, and education were grand-mean centered (see Peugh, 2010). We also included a dummy variable “relationship type” to control for whether participants completed the survey with their romantic partner (0) or with a close friend (1) and to control for any influence of relationship type. Third, to examine the within-person associations between daily gratitude and daily experiences of transgressions, we used the same multilevel models and the same stepwise approach as explained before. In order to examine the within-person association in this model, we included a between-person version and a within-person version of daily gratitude to control for the between-person effects and to truly examine the within-person variation in the model (cf. Bolger & Laurenceau, 2013). The between-person version corresponds to the person means of daily gratitude and the within-person version corresponds to the grand-mean centered daily gratitude minus the person mean. Again, we added age, gender, relationship type, education, and time as control variable to the model.

Materials and R-codes for the analyses are available on [https://osf.io/zc9n3/?view\\_only=38a914e0bd754a2183c7baf3df6ac103](https://osf.io/zc9n3/?view_only=38a914e0bd754a2183c7baf3df6ac103) for blinded peer review and will be made publicly available upon acceptance. Data are available upon request. The data cannot be made publicly available because we did not include in the consent form nor in the recruitment information that the data could be made publicly available.

## Results

**Cross-sectional associations.** We first examined the between-person association between dispositional gratitude and interpersonal transgressions at the initial assessment. Tables 4 and 5 show the descriptive statistics and correlations with gratitude, age and gender separately for different types of transgressions and with respect to the mean score, respectively. Similar to Study 1, gratitude in both daily diary studies was negatively related to all examined types of transgressions with similar effect sizes across studies. In Study 2, age

was only negatively related to violence and physical hurts (Table 4). In Study 3, age was negatively related to violence, physical hurts, damage, and stealing, whereas only one significant association was found for gender. There was a significant difference in the overall mean scores of interpersonal transgressions across the two studies (Study 2:  $M = 1.89$ ,  $SD = 0.86$ ; and Study 3:  $M = 3.07$ ,  $SD = 1.11$ ;  $t(794) = 16.42$ ,  $p < .001$ ,  $d = 1.17$ ), whereas the German sample reported more overall transgressions compared to the US sample. To examine the multivariate associations, we performed a multiple linear regression model. In Study 2, gratitude and age were negatively related to the retrospective assessment of transgressions, whereas gender was not significantly related to interpersonal transgressions (Table 3). Education was not a significant predictor of transgressions in the cross-sectional analyses. In Study 3, gratitude was uniquely associated with transgressions (Table 3). Age, gender, and education were not significantly related to transgressions.

**Prospective associations between gratitude and daily transgressions.** We next examined the prospective association between dispositional gratitude and daily interpersonal transgressions using multilevel models. First, we computed the intraclass correlation coefficients (ICCs) for daily transgressions. Results showed that in Study 2 69% and in Study 3 64% of the total variance of daily transgressions were within-person (plus residual variance), which justified the use of multilevel modeling. Results of the multilevel analysis predicting daily interpersonal transgressions are shown in Table 6. In line with our hypothesis, we found in Study 2 that gratitude was negatively related to daily transgressions controlling for age, gender, relationship type, education, and time. Education was positively related to daily transgressions, indicating that participants with higher levels of education reported more daily transgressions. The negative time effect indicated that the more time had passed in the daily diary study the fewer transgressions were reported. In contrast to Study 2, the results of Study 3 suggested that gratitude was not a statistically significant predictor of daily transgressions. However, the magnitude of the effect was largely similar to Study 2.

Similar to Study 2, education level and time were significant predictors of daily transgressions (Table 6).

**Prospective associations between transgressions and daily gratitude.** We also tested the predictive association between interpersonal transgressions and daily gratitude. Results of the multilevel analysis predicting daily gratitude are shown in Table 7. The ICC for daily gratitude showed that 26% in Study 2 and 30% in Study 3 of the total variance of daily gratitude were within-person (plus residual variance). In Study 2, the results of the multilevel analysis suggested that interpersonal transgression was a statistically significant predictor of daily gratitude. This indicates that people who report more interpersonal transgressions in general indicated lower levels of daily gratitude during the 10 days. In contrast to Study 2, the results from the multilevel analysis suggested that the negative effect of interpersonal transgressions on daily gratitude was smaller than in Study 2 and not statistically significant (Table 7).

**Concurrent associations between daily gratitude and experiences of transgressions.** Next, we tested daily within-person associations between daily gratitude and interpersonal transgressions using multilevel models. The results of these analyses are shown in Supplementary Table 1. In Study 2, within-person daily gratitude significantly predicted daily transgressions, indicating that within individuals, days with higher gratitude were significantly related to fewer interpersonal transgressions. The between-person version of gratitude was not significantly related to daily transgressions. At first sight, these results seem to be inconsistent with the results from Table 6 which suggested that dispositional gratitude predicted daily transgressions. When adding the between- and within-person versions of daily gratitude into the multilevel model, the between-person version of gratitude did not significantly predict daily interpersonal transgressions. Note, however, that the between-person component (average daily gratitude) and dispositional gratitude were not perfectly interrelated (see Table 5). In Study 3, the within-person regression of daily gratitude on daily

transgression was not significant, indicating that days with higher gratitude were unrelated to the amount of interpersonal transgression on the same day within individuals. The mixed results showed an inconsistent picture across the two daily diary studies in the US and Germany (Supplementary Table 1).

**Concurrent associations between daily experiences of transgressions and daily gratitude.** Finally, we also tested daily within-person associations between daily experienced transgressions and daily gratitude. In both daily diary studies, the within-person regression of daily experienced transgression on daily gratitude was not significant (Supplementary Table 2). The findings indicate, that days with more experiences of interpersonal transgressions were unrelated to the degree of gratitude on the same day and within individuals.

### **General Discussion**

In the present research, we examined associations between gratitude and perceived interpersonal transgressions using cross-sectional and daily diary data. Our first goal was to test the cross-sectional association between dispositional gratitude and interpersonal transgressions using three studies. In line with our expectations, all three studies provide evidence that grateful people report fewer transgressions compared to less grateful people at the general level. The second goal was to test the prospective influence of dispositional gratitude on daily transgressions as well as the prospective influence of retrospectively reported transgressions on daily gratitude. The results of the US daily diary study suggest that dispositional gratitude predicts fewer interpersonal transgressions in daily life and the same applies for the prospective association between transgressions and daily gratitude. In the German daily diary study, the findings are less consistent, although the findings also point to a negative association between gratitude and interpersonal transgressions. The third goal was to examine the within-person association between daily reported gratitude and daily experienced transgressions. The within-person findings at the daily level in the US sample mirrored the between-person findings on the negative association between gratitude and

interpersonal transgressions. That is, people who reported higher gratitude on one specific day also experienced fewer interpersonal transgressions on that day. Again, there was no statistically significant within-person association in the German sample.

Overall, the present findings suggest that grateful people indeed tend to perceive social exchanges differently and/or actually experience fewer interpersonal transgressions. The negative association between dispositional gratitude and retrospectively reported interpersonal transgressions is in line with the view that gratitude is related to a positive memory bias (Watkins, 2014), implying that grateful people recall their social exchanges as more positive. These findings are also consistent with previous research indicating that gratitude is positively correlated with distinct coping styles such as seeking for emotional and instrumental social support, positive reinterpretation, growth, and active coping (Wood, Joseph, & Linley, 2007). The tendency to remember social exchanges more positively may serve grateful people to maintain mental health and well-being. In addition to the potential positive perception bias, grateful people may actually experience fewer interpersonal transgressions because they evoke specific reactions from others, which are consistent with their own grateful disposition (Buss, 1987; Roberts et al., 2008). That is, grateful people may actively select more prosocial situations, which are consistent with their own disposition (Caspi & Roberts, 2001).

The US daily diary study suggests that grateful people do not only report fewer transgressions retrospectively, but also in their daily lives. Thus, it can be assumed that grateful people do perceive their daily social exchanges in a more positive way, which is supported by previous findings suggesting that grateful people tend to focus on the positive in the world (Watkins, 2014; Wood et al., 2010). In turn, the results of the US sample indicate that people, who in general experience more transgressions in their lives, report less daily gratitude. Consequently, negative interpersonal experiences seem to affect how people perceive their social environment and how grateful they are in their everyday life. The within-person findings, which showed that people who reported higher gratitude on one specific day

experienced fewer interpersonal transgressions on that day, support the claim that higher gratitude is related to a positive perception bias (Watkins, 2014; Wood et al., 2010). Recent research that used daily diary studies examined the “seeing” or missing of partners’ sacrifices. Importantly, “seeing” partners’ daily sacrifices – accurately or inaccurately - is crucial for boosting gratitude (Visserman et al., 2018). This also indicates that dispositionally grateful people may have biased perceptions of others’ motives of specific transgressions and may “see” transgressions of others less often – irrespective of whether they are transgressed or not.

Interestingly, the present findings suggest cross-cultural differences between the US and Germany in the association between gratitude and experiences of interpersonal transgressions when using the daily diary approach. Regarding the German sample, we found a significant negative cross-sectional association between gratitude and transgressions, but could not replicate the significant findings of the US daily diary study in the German sample. Overall, the US sample in Study 2 reported fewer experienced transgression when asked retrospectively but more transgressions when asked in daily life compared to participants from the German sample. Research on cross-cultural differences comparing the amount of perceived negative social interactions and/or gratitude between the US and Germany is lacking. However, there exist cross-cultural prototype analyses on the description of gratitude between the US and another European country (i.e., the UK; Lambert, Graham, & Fincham, 2009; Morgan, Gulliford, & Kristjánsson, 2014). A key finding was that the UK sample documented a higher frequency of negative gratitude features compared to a US sample (Lambert et al., 2009). Laypeople in the UK linked gratitude more often with various negative emotions including guilt, indebtedness, embarrassment, and awkwardness (Morgan et al., 2014). Thus, it may be that each culture encompasses specific social norms, which affect the conceptualization of gratitude (Appadurai, 1985). Future research should investigate how laypeople conceptualize gratitude, how this construct is connected to daily social interactions across different cultures, and whether differences in conceptions of gratitude can explain the

present cross-cultural differences in reports of transgressions. Though an interesting future direction, this again is largely speculative given that the cross-cultural differences found were not anticipated.

The present research not only revealed a negative cross-sectional association between gratitude and transgressions, but also a negative association between age and retrospective reports of transgressions. This age effect is in line with previous research (e.g., Birditt et al., 2005; Steiner et al., 2011). Previous theory and research have sought to explain why older adults perceive and experience interpersonal stressors differently than younger adults. Older adults may perceive fewer interpersonal transgressions because they tend to direct their attention away from negative stimuli (Mather & Carstensen, 2003) and minimize negative feelings (Lavouvie-Vief, 2003). This phenomenon is referred to as the “positivity effect” (Carstensen & Mikels, 2005). Older adults may also remember fewer interpersonal transgressions (Charles, Mather, & Carstensen, 2003) as well as evoke fewer confrontational and more avoidant behaviour from other people (Miller et al., 2009). Older adults tend to focus on social partners that are more familiar and emotionally meaningful to them (Carstensen, Isaacowitz, & Charles, 1999), which may lead to a more prosocial environment including fewer interpersonal transgressions. When it comes to a recall of past events over longer time frames, older adults seem to either summarize their social exchanges in a more positive light or they do experience fewer transgressions due to the afore mentioned evocation or selection effects.

We did not find evidence for age effects using the daily diary design, which seems paradoxical. However, according to the socioemotional selectivity theory (SST; Carstensen et al., 1999) is old age associated with a reduced number of stressors in daily life because the shrinking time horizon prompts older adults to focus on positive experiences and emotionally meaningful activities, which also motivates them to proactively reduce the number or negative encounters in their daily lives. Hence, it may be that older and younger adults cope



differently with the same amount of interpersonal transgressions in daily life. Older adults seem to be more motivated to regulate negative affect and they tend to be better in doing so than younger adults (Blanchard-Fields, Mienaltowski, & Seay, 2007; Hofer, Burkhard, & Allemand, 2015). Moreover, recent research found no age differences with respect to the experience of stressful events in daily life, but older adults perceived these events as less unpleasant compared to younger adults (Neubauer, Smyth, & Sliwinski, 2018).

Overall, the differential findings regarding our cross-sectional and daily diary studies may point to the fact that retrospective assessments and daily diary assessments are connected to different underlying cognitive processes (Schwarz, 1999) and highlight the importance of future studies to use both methods.

### **Limitations and Future Directions**

Although the present research advances previous work by showing associations between gratitude and interpersonal transgressions using cross-sectional and daily diary data, the present research is limited in ways that should promote future experimental and intensive longitudinal research. With the current data, we cannot test the proposed potential mechanisms for the negative association between gratitude and interpersonal transgressions. Future experimental and intensive longitudinal studies, which are specifically designed to test the underlying processes and mechanisms should provide a better understanding whether grateful individuals perceive social exchanges as more positively and thus report fewer interpersonal transgressions and/or actually experience fewer transgressions in their everyday life because they evoke fewer negative reactions from others and/or actively select more prosocial situations.

Additionally, it remains unclear at what time interval people should be asked about their experienced transgressions and their gratitude to combine these two constructs conceptually meaningful (George & Jones, 2000). In the present daily diary studies, we assessed daily gratitude and daily transgressions both in the evening and asked people about

their experiences during the last 24 hours. However, it may be that some people did not report transgressions because they forgot or down-regulated what happened during the day.

Consequently, it may be beneficial for future studies to minimize possible memory biases by using event-contingent designs and to assess daily transgressions and momentary gratitude multiple times per day via smartphones. Event-contingent designs are particularly useful to assess events with low base-rates, such as transgressions (Moskowitz & Sadikaj, 2012). Using emerging computational sensing technologies to automatically detect predefined transgressions (e.g., a negative social exchange) that can trigger sampling and thereby data collection within people's natural environments (Sandstrom, Lathia, Mascolo, & Rentfrow, 2017) would improve the assessment of interpersonal transgressions. However, clear definitions of specific transgressions are important and needed for not distorting the frequency and allowing people to make an easy distinction when indicating whether or not a transgression has occurred.

Also, it may be worthwhile for future research to look at different forms of transgressions and how they relate with each other more closely and separately to provide more detailed information on experienced interpersonal transgressions. For instance, previous research on daily hassles and daily stressful events showed that people who experience one type of stressor are more likely to also experience other types of stressors (Almeida, 2005; Serido, Almeida, & Wethington, 2004). And besides the mere indication of transgression exposure, it may add value to future research to obtain detailed accounts of each transgression. For instance, previous research could show that stressor reactivity is twice as important as stressor exposure in explaining the neuroticism-distress relationship (Bolger & Schilling, 1991). Thus, assessing perceived transgression severity and details on the context in which people are exposed to transgressions (e.g., are the same people involved in each transgression or is there a varying context) may add important information when investigating occurrences of interpersonal transgressions and its relation to gratitude.

**Conclusion**

The current research significantly extends prior research by testing the association between gratitude and interpersonal transgressions. To the best of our knowledge, this is the first work to investigate this association using both cross-sectional and daily diary data. Our cross-sectional findings suggest that grateful people do, in general, report fewer interpersonal transgressions. We also found some evidence for the predictive role of gratitude on transgressions in daily life and the predictive role of transgressions on gratitude in daily life. Moreover, people who reported more gratitude on one specific day also experienced fewer interpersonal transgressions on that day. As such, this research provides some important initial steps toward understanding how grateful people may perceive social exchanges differently than less grateful people. Our results also represent a challenge to future theorizing and research to investigate underlying processes and mechanisms to provide a better understanding how and why grateful individuals view their daily lives differently from others.

### Footnotes

<sup>1</sup> The item “spread rumors or gossiped about you” of the original version was not included due to an error.

<sup>2</sup> Education was not assessed in Study 1.

<sup>3</sup> Two previous papers have used this data set (Allemand & Hill, in press; Hill, Katana, & Allemand, 2018). Of those papers, one paper has examined three variables here (i.e., dispositional gratitude, daily gratitude, and age). Allemand and Hill (in press) examined how daily gratitude is related to daily time perceptions. However, this previous work did not consider interpersonal transgressions and was focused on markedly different research questions.

<sup>4</sup> One previous manuscript used the same data set (Katana, Hill, & Allemand, under review). However, this work did not consider gratitude nor interpersonal transgressions and was focused on markedly different research questions.

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Table 1

*Descriptive Statistics of Interpersonal Transgressions, and Zero-Order Correlations with Gratitude and Demographic Variables in Study 1*

	<i>M</i>	<i>SD</i>	<i>r</i> <sub>gratitude</sub>	<i>r</i> <sub>age</sub>	<i>r</i> <sub>gender</sub>
Insulted you	2.70	1.05	-.19**	-.13**	-.04
Took advantage of you	3.01	1.12	-.12**	-.08**	-.09**
Betrayed you	2.81	1.17	-.17**	-.16**	-.10**
Lied to you	3.15	1.09	-.15**	-.09**	-.11**
Was unfaithful to you	2.59	1.26	-.15**	-.10**	-.04
Hurt you physically	2.06	1.19	-.19**	-.15**	-.00
Damaged something that belonged to you	2.39	1.17	-.15**	-.12**	-.01
Stole from you	2.38	1.21	-.18**	-.06**	.03
Failed to appreciate you adequately	3.08	1.22	-.12**	-.11**	-.13**
Told a secret that they promised not to tell	2.45	1.20	-.14**	-.18**	-.04
Got even with you for something that happened previously	2.07	1.12	-.20**	-.18**	.06*
Benefited from your misfortune	2.27	1.22	-.21**	-.13**	.04
Teased you	2.91	1.19	-.10**	-.08**	-.06*
Degraded you in public	2.30	1.25	-.18**	-.16**	-.04
Was violent toward you	2.06	1.21	-.19**	-.15**	.01
Was “two-faced” or insincere	2.79	1.20	-.17**	-.20**	-.07**
Got you in trouble	2.27	1.15	-.20**	-.20**	.06*
Told you something that hurt you	2.90	1.20	-.15**	-.15**	-.12**
Failed to protect you or stick up for your rights	2.59	1.30	-.16**	-.18**	-.08**

Note. *N* = 1,551; possible range: *never* (1) to *very often* (5).

\**p* < .05, \*\**p* < .01.



Table 2

*Descriptive Statistics and Zero-Order Correlations Among Study Variables in Study 1*

Variable	1	2	3	4
1. Gratitude	-			
2. Interpersonal transgressions	-.22**			
3. Age	.14**	-.18**	-	
4. Gender	-.16**	-.05*	.22**	-
Possible range	1-7	1-5	18-91	
<i>M</i>	5.63	2.57	48.35	69.8% <sup>a</sup>
<i>SD</i>	1-12	0.89	16.26	

*Note.*  $N = 1,552$ ; <sup>a</sup> = percentage of female participants. Gender: reference category = female.

\*  $p < .05$ , \*\*  $p < .01$ .

Table 3

*Cross-Sectional Results of the Multiple Regression Predicting Interpersonal Transgressions*

	Study 1 (N = 1,552)			Study 2 (N = 352)			Study 3 (N = 444)		
	<i>B</i> (95% CI)	<i>SE</i>	$\beta$	<i>B</i> (95% CI)	<i>SE</i>	$\beta$	<i>B</i> (95% CI)	<i>SE</i>	$\beta$
(Constant)	2.60 (2.55; 2.65)	.03		1.88 (1.75; 2.02)	.07		3.12 (2.98; 3.26)	.07	
Gratitude	-.17 (-.21; -.13)	.02	-.21**	-.31 (-.41; -.21)	.05	-.33**	-.34 (-.46; -.22)	.06	-.25**
Age	-.01 (-.01; -.00)	.00	-.14**	-.01 (-.02; -.00)	.00	-.12*	-.01 (-.02; .00)	.01	-.08
Gender	-.10 (-.20; -.01)	.05	-.05*	.04 (-.14; .22)	.09	.02	-.09 (-.29; .11)	.10	-.04
Relationship type	-	-	-	-.11(-.35; .13)	.12	-.05	-.17 (-.85; .51)	.35	-.02
Education	-	-	-	.06 (-.00; .12)	.03	.10	-.03 (-.08; .03)	.03	-.04
<i>Adjusted R</i> <sup>2</sup>		.07			.11			.07	
<i>F</i>		40.56**			8.89**			7.24**	

*Note.* Relationship type and education were not assessed in Study 1. Gender: reference category = female. Relationship type: reference category = romantic partner.

\*  $p < .05$ , \*\*  $p < .001$ .

Table 4

*Descriptive Statistics of Interpersonal Transgressions, and Zero-Order Correlations with Gratitude and Demographic Variables*

	Study 2 ( <i>N</i> = 353)					Study 3 ( <i>N</i> = 444)				
	<i>M</i>	<i>SD</i>	<i>r</i> <sub>gratitude</sub>	<i>r</i> <sub>age</sub>	<i>r</i> <sub>gender</sub>	<i>M</i>	<i>SD</i>	<i>r</i> <sub>gratitude</sub>	<i>r</i> <sub>age</sub>	<i>r</i> <sub>gender</sub>
Insulted, degraded, teased, or spread rumors about you	2.00	1.16	-.28**	-.08	.07	3.28	1.35	-.18**	-.05	-.10*
Lied or betrayed you, or were insincere to you	2.18	1.15	-.24**	-.07	.00	3.60	1.22	-.21**	-.03	-.06
Were violent toward you or physically hurt you	1.30	0.85	-.25**	-.13*	.08	2.45	1.59	-.22**	-.12*	-.01
Got you in trouble, or failed to stick up to you	1.74	1.08	-.28**	-.08	.04	3.00	1.43	-.24**	-.06	-.00
Either damaged or stole your property	1.49	0.91	-.12*	-.10	.09	2.30	1.40	-.25**	-.11*	.00
Had an argument or disagreement with you	2.64	1.28	-.12*	-.09	-.06	3.81	1.22	-.15**	-.08	-.00

*Note.* Possible range of frequency: *not at all* (1) to *constantly* (7).\*  $p < .05$ , \*\*  $p < .01$ .

Table 5

*Descriptive Statistics and Zero-Order Correlations Among Study Variables*

Variable	Study 2 ( <i>N</i> = 352)								Study 3 ( <i>N</i> = 444)							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1. Gratitude	-								-							
2. Daily gratitude	.36**	-							.37**	-						
3. Interp. transgressions	-.30**	-.18**	-						-.26**	-.07	-					
4. Daily transgressions	-.10	-.03	.40**	-					-.10*	-.08	.34**	-				
5. Age	.02	.07	-.11*	-.09	-				.07	-.02	-.10*	-.09	-			
6. Gender	-.07	.04	.04	-.02	.06	-			-.06	-.03	-.04	-.03	.11*	-		
7. Relationship type	-.08	-.06	-.00	.02	-.14**		-		-.06	.00	.00	.06	-.12*	.00	-	
8. Education	.17**	.05	.05	.15**	-.05	.07	.01	-	.05	.07	-.05	.11*	-.15**	.05	-.03	-
Possible range	1-7	1-5	1-7	0-6	18-77			1-7	1-7	1-6	1-7	0-6	20-75			1-6
<i>M</i>	5.50	3.73	1.89	0.26	45.57	48.3% <sup>a</sup>	79.0% <sup>b</sup>	3.69	5.03	3.69	3.07	0.20	47.63	50% <sup>a</sup>	97.7% <sup>b</sup>	3.12
<i>SD</i>	0.91	0.81	0.86	0.51	13.71			1.46	0.83	1.15	1.11	0.38	10.17			1.76

*Note.* Daily transgressions = aggregated means; <sup>a</sup> = percentage of women in the sample; <sup>b</sup> = percentage of romantic relationships. Gender: reference category = female. Relationship type: reference category = romantic partner.

\*  $p < .05$ , \*\*  $p < .01$ .

Table 6

*Results of the Multilevel Analysis Predicting Daily Interpersonal Transgressions*

	Study 2 ( $N = 2,508$ observations)				Study 3 ( $N = 3,288$ observations)			
	Estimate	$SE$	$CI_{95}$		Estimate	$SE$	$CI_{95}$	
			Lower	Upper			Lower	Upper
Fixed Effects								
Intercept	0.36***	0.04	0.28	0.45	0.49***	0.05	0.62	0.77
Gratitude	-0.06*	0.03	-0.12	-0.01	-0.05	0.03	-0.11	0.00
Age	< .01	0.00	-0.01	0.00	< .01	0.00	-0.01	0.00
Gender	-0.06	0.05	-0.15	0.04	-0.02	0.05	-0.12	0.07
Relationship type	-0.02	0.07	-0.14	0.11	0.14	0.16	-0.18	0.45
Education	0.05**	0.02	0.02	0.09	0.03*	0.01	0.00	0.06
Time	-0.01***	0.00	-0.02	-0.01	-0.03***	0.01	-0.04	-0.02
Random Effects								
Intercept	0.27***				0.48***			
Time	< .01***				< .01***			
Residuals	0.33				0.32			
AIC	4893.99				6624.97			
BIC	4958.09				6692.04			

*Note.* Coefficients are unstandardized. *SE* represents the standard error of the unstandardized regression coefficients. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion. Gender: reference category = female. Relationship type: reference category = romantic partner.

\*  $p < .05$ . \*\*  $p < .001$ .

Table 7

*Results of the Multilevel Analysis Predicting Daily Gratitude*

	Study 2 ( <i>N</i> = 2,508 observations)				Study 3 ( <i>N</i> = 3,284 observations)			
	Estimate	<i>SE</i>	CI <sub>95</sub>		Estimate	<i>SE</i>	CI <sub>95</sub>	
			Lower	Upper			Lower	Upper
Fixed Effects								
Intercept	4.09***	0.11	3.87	4.30	4.00***	0.17	3.67	4.33
Interpersonal transgressions	-0.17***	0.05	-0.27	-0.08	-0.05	0.05	-0.28	0.14
Age	-0.00	0.00	-0.01	0.01	-0.00	0.01	-0.01	0.01
Gender	0.04	0.08	-0.13	0.20	-0.07	0.11	-0.28	0.14
Relationship type	-0.16	0.11	-0.37	0.06	0.15	0.36	-0.55	0.86
Education	0.03	0.03	-0.02	0.09	0.04	0.03	-0.02	0.10
Time	-0.00	0.00	-0.01	0.00	-0.02***	0.01	-0.03	-0.01
Random Effects								
Intercept	0.50***				1.02***			
Time	< .001***				< .01***			
Residuals	0.18				0.49			
AIC	4042.62				8432.04			
BIC	4106.72				8499.10			

*Note.* Coefficients are unstandardized. *SE* represents the standard error of the unstandardized regression coefficients. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion. Gender: reference category = female. Relationship type: reference category = romantic partner.

\*  $p < .001$ .

Supplementary Table 1

*Results of the Multilevel Analysis Daily Gratitude Predicting Daily Interpersonal Transgressions*

	Study 2 ( <i>N</i> = 2,506 observations)				Study 3 ( <i>N</i> = 3,287 observations)			
	Estimate	<i>SE</i>	CI <sub>95</sub>		Estimate	<i>SE</i>	CI <sub>95</sub>	
			Lower	Upper			Lower	Upper
Fixed Effects								
Intercept	0.36***	0.05	0.27	0.45	0.49***	0.05	0.39	0.59
Within gratitude	-0.10*	0.04	-0.18	-0.01	-0.01	0.03	-0.06	0.04
Between gratitude	-0.03	0.03	-0.09	0.03	-0.04	0.02	-0.08	0.01
Age	-0.00	0.00	-0.01	0.00	-0.00	0.00	-0.01	0.00
Gender	-0.04	0.05	-0.14	0.05	-0.02	0.05	-0.11	0.08
Relationship type	-0.00	0.07	-0.13	0.13	0.15	0.16	-0.17	0.46
Education	0.05**	0.02	0.01	0.08	0.03*	0.01	0.00	0.06
Time	-0.02***	0.00	-0.02	-0.01	-0.03***	0.01	-0.04	-0.02
Random Effects								
Intercept	0.28***				0.49***			
Time	< .001***				< .01***			
Residuals	0.32				0.32			
AIC	4882.27				6623.99			
BIC	4952.18				6697.17			

*Note.* Coefficients are unstandardized. *SE* represents the standard error of the unstandardized regression coefficients. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion. Gender: reference category = female. Relationship type: reference category = romantic partner.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Supplementary Table 2

*Results of the Multilevel Analysis Daily Transgressions Predicting Daily Gratitude*

	Study 2 ( <i>N</i> = 2,506 observations)				Study 3 ( <i>N</i> = 3,287 observations)			
	Estimate	<i>SE</i>	CI <sub>95</sub>		Estimate	<i>SE</i>	CI <sub>95</sub>	
			Lower	Upper			Lower	Upper
Fixed Effects								
Intercept	3.77***	0.06	3.65	3.90	3.85***	0.08	3.70	4.00
Within transgr.	-0.03	0.04	-0.19	0.14	-0.10	0.10	-0.16	0.23
Between transgr.	-0.05	0.09	-0.22	0.11	-0.10	0.10	-0.29	0.09
Age	0.00	0.00	-0.01	0.01	-0.00	0.01	-0.01	0.01
Gender	0.02	0.08	-0.15	0.19	-0.06	0.11	-0.27	0.15
Relationship type	-0.15	0.11	-0.37	0.07	0.20	0.36	-0.51	0.90
Education	0.03	0.03	-0.03	0.09	0.05	0.03	-0.01	0.06
Time	-0.01	0.00	-0.01	0.00	-0.02***	0.01	-0.04	0.11
Random Effects								
Intercept	0.52***				1.01***			
Time	< .001***				< .001***			
Residuals	0.18				0.49			
AIC	4034.88				8441.23			
BIC	4104.80				8514.23			

*Note.* Coefficients are unstandardized. *SE* represents the standard error of the unstandardized regression coefficients. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion. Gender: reference category = female. Relationship type: reference category = romantic partner.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .